

## CLAIMS

We claim:

1. A hands free system for operating a mobile terminal in a vehicle  
5 having a steering wheel, comprising:  
a processing module detachably coupled to a mobile terminal;  
an audio input device mounted substantially in a center area of the steering  
wheel of the vehicle, the audio input device operatively connected to the processing  
module;  
10 a switch located in a predetermined area of the steering wheel, the switch  
operatively connected to the processing unit; and  
an stereo operatively connected to the processing module.
2. The hands free system according to claim 1, wherein the audio input  
15 device is a microphone.
3. The hands free system according to claim 1, wherein the stereo  
comprises at least an audio amplifier operatively connected to at least one speaker.
- 20 4. The hands free system according to claim 1, wherein the processing  
module is detachably coupled to the mobile terminal via a cable having a universal  
connector that interfaces to a plurality of different mobile terminals.
5. The hands free system according to claim 1, wherein the processing  
module is structured to give priority to a signal from the mobile terminal over any  
25 other signal in the stereo.

6. The hands free system according to claim 1, wherein the hands free system further comprises a display operatively connected to the processing module for displaying information relative to the connected mobile terminal.

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7. The hands free system according to claim 6, wherein the displayed information is downloaded information that is used by the mobile terminal.

8. The hands free system according to claim 1, wherein the switch is a toggle-type switch, and wherein each toggle of the switch is an indication to proceed to the next stage in call handling by the mobile terminal.

9. The hands free system according to claim 1, wherein the processing module is structured for at least one of: to mute the audio input device, to connect the audio input device to a voice input processor of the mobile terminal when a call is connected, to connect an earpiece amplifier output of the mobile terminal to an amplifier input of the stereo when a call is connected, to connect a preamplifier output of the stereo to the audio input of the stereo when a call is not connected or being setup, to connect the preamplifier output of the hands free mobile system to the audio input of the when the call is being setup, to store telephone numbers and associate them with spoken tokens, and to prompt a user to provide phone numbers to dial.

10. The hands free system according to claim 1, wherein the processing module further comprises a voice recognition module for at least converting spoken

numbers into digits, and spoken words into tokens associated with a memory location in a memory in the processing module.

11. The hands free system according to claim 1, wherein the hands free  
5 system further comprises a PC serial port connector for interfacing the processing module to a personal computer.

12. The hands free system according to claim 11, wherein the personal  
computer has a phone directory, wherein the processing module has a phone  
10 directory, and wherein the phone directory in the processing module is synchronizable with the phone directory in the personal computer via the PC serial port connector.

13. The hands free system according to claim 11, wherein the personal  
computer has a synchronization program, wherein the processing module has a  
15 synchronization program, and wherein the synchronization program in the processing module is updateable with the synchronization program in the personal computer via the PC serial port connector.

14. The hands free system according to claim 1, wherein the processing  
20 module is structured to send digits to be dialed to the mobile terminal via the cable.

15. A hands free system for operating a mobile terminal in a vehicle having a steering wheel, comprising:
- a processing module detachably coupled to a mobile terminal;
  - 5 a microphone mounted substantially in a center area of the steering wheel of the vehicle, the microphone operatively connected to the processing module;
  - a switch located in a predetermined area of the steering wheel, the switch operatively connected to the processing unit;
  - a display operatively connected to the processing module for displaying
  - 10 information relative to the connected mobile terminal; and
  - a vehicle sound system operatively connected to the processing module.
16. The hands free system according to claim 15, wherein the processing module is detachably coupled to the mobile terminal via a cable having a universal
- 15 connector that interfaces to a plurality of different mobile terminals.
17. The hands free system according to claim 15, wherein the processing module is structured to give priority to a signal from the mobile terminal over any other signal in vehicle sound system.
- 20 18. The hands free system according to claim 15, wherein the displayed information is downloaded information that is processed in the mobile terminal.

19. The hands free system according to claim 15, wherein the switch is a toggle-type switch, and wherein each toggle of the switch is an indication to proceed to the next stage in call handling by the processing module.

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20. The hands free system according to claim 15, wherein the processing module is structured for at least one of: to mute the microphone, to connect the microphone to the voice input processor of the mobile terminal when a call is connected, to connect the earpiece amplifier output of the mobile terminal to the amplifier input of the vehicle sound system when a call is connected, to connect the preamplifier output of the stereo to the audio input of the stereo when a call is not connected or being setup, to connect the preamplifier output of the hands free mobile system to the processing module of the hands free mobile system when the call is being setup, to store telephone numbers and associate them with spoken tokens, and to prompt a user to provide phone numbers to dial.

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21. The hands free system according to claim 15, wherein the processing module further comprises a voice recognition module for at least converting spoken numbers into digits, and spoken words into tokens associated with a memory location in a memory in the processing module.

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22. The hands free system according to claim 15, wherein the hands free system further comprises a PC serial port connector for interfacing the processing module to a personal computer.

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23. The hands free system according to claim 22, wherein the personal computer has a phone directory, wherein the processing module has a phone directory, and wherein the phone directory in the processing module is synchronizable with the phone directory in the personal computer via the PC serial port connector.

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24. The hands free system according to claim 22, wherein the personal computer has a synchronization program, wherein the processing module has a synchronization program, and wherein the synchronization program in the processing module is updateable with the synchronization program in the personal computer via the PC serial port connector.

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25. The hands free system according to claim 1, wherein the processing module is structured to send digits to be dialed to the mobile terminal via the cable.

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26. A method for providing hands free operation of a mobile terminal in a vehicle having a steering wheel, the hands free system having: a processing module detachably coupled to a mobile terminal; a microphone mounted substantially in a center area of the steering wheel of the vehicle, the microphone operatively connected to the processing module; a switch located in a predetermined area of the steering wheel, the switch operatively connected to the processing unit; a display operatively connected to the processing module for displaying information relative to the connected mobile terminal; and a vehicle sound system operatively connected to the processing module, comprising the steps of:

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(a) initially placing the system in an idle state;

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(b) determining if the switch has been toggled;

(c) returning to step (a) if the switch has not been toggled, and muting the amplifier and turning on the microphone if the switch has been toggled;

(d) collecting digits using voice recognition or determining the stored numbers to be dialed based on a voice token;

5 (e) determining if the switch has been toggled;

(f) returning to step (d) if the switch has not been toggled, and playing sounds for the numbers to be dialed via the amplifier and displaying the numbers on the display;

(g) determining if the switch has been toggled;

10 (h) starting, if the switch has not been toggled, a timer and when a predetermined time has expired returning to the idle state, and until then returning to step (g);

(i) if the switch has been toggled, sending dialed numbers to the mobile terminal, connecting the earpiece amplifier output of the mobile terminal to the amplifier of the vehicle sound system, connecting the microphone preamplifier output of hand free mobile system to voice input processor of the mobile terminal;

15 (j) dialing the number at the mobile terminal;

(k) connecting the call;

(l) maintaining call connection;

20 (m) determining if the switch has been toggled;

(n) returning to step (l) if the switch has not been toggled, and returning to step (a) if the switch has been toggled.

27. A method for providing hands free operation of a mobile terminal in a vehicle having a steering wheel, the hands free system having: a processing module detachably coupled to a mobile terminal; a microphone mounted substantially in a center area of the steering wheel of the vehicle, the microphone operatively connected to the processing module; a switch located in a predetermined area of the steering wheel, the switch operatively connected to the processing unit; a display operatively connected to the processing module for displaying information relative to the connected mobile terminal; and a vehicle sound system operatively connected to the processing module, comprising the steps of:
- (a) initially placing the system in an idle state;
  - (b) determining if there is an incoming call, returning to step (a) if there is no incoming call, and proceeding to the next step if there is an incoming call;
  - (c) connecting the microphone to the mobile terminal voice input processor, announcing the calling party information on the stereo amplifier, and displaying it on the screen; and connecting the mobile terminal ear piece output to the stereo amplifier;
  - (d) determining if the switch has been toggled;
  - (e) starting, if the switch has not been toggled, a timer, and if the switch has been toggled proceeding to step (g);
  - (f) when a predetermined time has expired (step 406) returning to the idle state, and until then returning to step (d);
  - (g) carrying out the conversation, the call is connected; and



(h) determining if the switch has been toggled, and if the switch has not been toggled returning to step (g), and if the switch has been toggled returning to the idle state.